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Psoriasis : with particular emphasis on the etiology and treatment

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**Psoriasis: With Particular Emphasis to the Etiology
and Treatment**

**Presented to the Faculty of the University of
Nebraska College of Medicine as partial fulfillment
for the Degree of Doctor of Medicine.**

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Omaha, Nebraska

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INTRODUCTION

Skin diseases being among the most frequent affection suffered by man, and their ability to lull the inexperienced or uninitiated into a false sense of security by the apparent triviality or benignity of the disease process, in comparison to the oftentimes much more severe appearing medical and surgical diseases, the writer believes that the significance and results of diseases of the skin are insufficiently emphasized to the student of Medicine. Skin diseases are said to constitute from ten to twenty-five percent of a general practitioners work, and since the incidence of psoriasis is rather high on the dermatological scale, I have selected this common skin disease for discussion and to gain a better insight to Dermatology in general.

I do not write this in the attitude of a specialist, but rather this is the work of the student of general medicine correlating the writing and observations of authorities and others on the subject of psoriasis. In this article the writer will stress the etiological manifestations and the treatment of the disease process. It is with these factors that the general practitioner is primarily interested.

HISTORY

Since the beginning of the advent of man on the earth, mankind has considered questions of medical import. The cave men undoubtedly had herbs and berries which he ate with a superstitious, and sometimes well founded belief in pain relief and curative powers. When man congregated into groups and tribes, he had the much respected and politically powerful medicine man to administer his ills and drive out the evil spirits. From earliest times diseases of the skin have been in the front ranks in the practice of medicine. This is probably due to the attention drawn to the skin by itching, visualization of eruptions, sores, parasites that affected the skin. Probably one of the first medical practices was the attempt to rid man of skin lesions and parasites and to relieve itching of the skin. This practice may have arisen from man's irascibility and intolerance under such conditions.

Pusey (42) gives authority to these speculations by the support and emphasis given to skin diseases in the earliest records. Pusey (42) states in his "History of Dermatology" that the ancient Edwin Smith papyrus and the Ebers papyrus denote much of their space to skin diseases. The Bible refers to many skin diseases such as Leprosy, the "issue" and the plagues affecting the Israelites; yet

they cannot be positively identified because of their vague allusion.

Psoriasis has been among the most ancient of skin diseases. Modern dermatologists contend, and it is quite widely upheld that leprosy, as the Bible (6) describes it, of which Naaman was healed by dipping his body "Seven times in the Jordan", and which was transferred to Gehazi so that "he went out from his presence a leper white as snow", was in reality, psoriasis. From this time down it seems as though there have been as many treatments as there have been diagnosticians of the disease.

Psoriasis, we find, remains an obscure disease and confused with other dermatological diseases of similar characteristics for many years, before any action was taken to advance it as an individual entity.

According to Pusey (43) Celsus (25 B. C.-50 A. D.) was the first person to describe Psoriasis with recognizable accuracy. Most of Celsus prolific writing was on the dermatological subjects.

Discussion of psoriasis waned or is lost until late in the eighteenth century when Robert Willan, according to Garrison (60) published his articles on "Cutaneous diseases" and which Thomas Pateman finished. At this time then, psoriasis became definitely described and catalogued in a good classification of dermatological diseases. Galier (1797-1866) (17) described Pityriasis rosea and gave

differentiating characteristics from diseases including psoriasis. Goodman (20) gives much credit to Precasuitz, a German farmer who reported some treatments still in use, and to Chard, a Frenchman who also intensively studied the disease.

From this time through the nineteenth century and thus far into the twentieth, advances have been made along the more specific aspects of the disease entity.

The etiological factor has been attacked vigorously and sometimes furiously, especially since 1900, in an attempt to disclose the cause or causes and through this to arrive at a more satisfactory mode of treatment of the disease. These are later taken up in this paper.

ETIOLOGY

The direct etiological agent of psoriasis is, at the present time unknown. From the earliest recorded work on this dermatological problem through all the ages many articles have been written and there are almost as many theories advanced as there are authors. These theories have been argued pro and con with varying vehemence and criticism. The theories have been arrived by both subjective and objective reasoning and in many cases backed by apparently successful experiments. In the light of improvement in experimental technique and knowledge gained by the experiments themselves most of these theories are now discounted.

The Greek physicians of the Attic period brought forth the hypothesis that the fluids of the body were responsible for all dermatoses. This influence limited dermatologic knowledge until leprosy was found definitely controllable only by isolation. Opinions change slowly, and it was only with the help of an epidemic of Syphilis which swept from country to country, McKee and Foster (31) that an outside causative factor was considered for the dermatoses. In 1700, Physicians began, in a crude way to formulate classifications and recognize many of the dermatoses as they are known today.

Willan (60,42,17) was the first to classify the derma-

toses seriously. He did this purely from a morphological standpoint, placing in a few main groups multiple entities with polyvalent etiology. Due to increasing knowledge Willan's classification was gradually outmoded.

The etiology of psoriasis is a broad subject. The literature may be traced and the above is only a very rough resume of the work done up to Willan's classification. Due to the influence of the times and physicians of that era it may be deduced that many of the lepers, as mentioned in the Bible, were individuals with psoriasis and were shunned as infected and unclean person.

The etiology of psoriasis as to age, sex, occupation, social conditions, diet dyscrasias or deficiencies, heredity, parasites, bacteria, and neurological aspects, have been argued pro and con for a great number of years. Heredity enters into a discussion of any disease the etiology of which is little understood. Heredity in most cases is a direct transmission of a disease process, and as such is probably not the case in psoriasis, is confusing in its broad sense. As used here it suggests a predisposition or weakened body tissue which is so changed that it is susceptible to the various conditions and diseases of the parental and ancestral tree. Pollitzer (41) and Schamberg (48) deny the probability that heredity can be seriously considered in the etiology of psoriasis.

Knowles (26) found, in a large series of cases, only six families in which more than one member was affected. Engman (14), however, shows in his work the existence of a psoriatic family tree. In this tree he uncovered the history of fourteen cases in six generations of the family. He concludes that this is proof of at least an hereditary tendency. Stelwagon (51) believes that this apparent tendency is more definitely a proof of the presence of a communicable process other than heredity. Stelwagon hints at a strong possibility of a parasitic infestation. Willan is in accord with the hereditary predisposition theory.

The humoral theory or, that a weakened systemic condition, as in gout, rheumatism, and in arthritic individuals seems to provide an increased susceptibility is another theory advanced. Parkhurst (38), Schamberg (47), and others found that, more often than not, the condition occurred in the more robust type of individuals.

Beinhauer (4) believes that focal infection, constipation, endocrine and other glandular disturbances either alone or in combination are apparently very important etiological factors. That these factors influence the course and recovery, was thought by many authors, to be borne out by the clearing up of the associated conditions. Burnette (9) lays great stress on the "intestinal indigestion and absorption of metabolic products". He feels that metabolism plays

an important part and that most cases may be controlled by diet. Pollitzer (41) considers diet practically out of the question since, he has pointed out, variations in diet in various countries and in all economical social strata psoriasis still may be seen in about the same percentage of cases. He also pointed out that treatment is as good in Germany and England as in France where diet therapy has extensive support.

The neurogenic or neuropathic theory has many supporters, and much data may be collected in its favor. The association of psoriasis to arthritic diseases tends to point to a nervous origin. One of the main features is, that the lesions appear or have their beginning at points of cutaneous pressure or points of constant cutaneous irritation; sometimes, though rarely, it seems to be limited for a time at least to a regional nerve distribution, its appearance during pregnancy and lactation, or following emotional attacks, and the occurrence of associating sciatica and prickly sensations in the ends of the fingers and toes all point, and give support, to the neurogenic viewpoint. Ravalgi (44) has been a leading proponent of this theory in this country. Ravalgi leans to this theory with reservations, he says, "nothing evolves from nothing and if the eruption has its origin in the nervous system there must be

a serous effusion, an infiltration, or hardening of some sort in the meninges which causes irritation of the nerves which control the nutrition of the skin". In the main this theory is in accord with the ideas of Unna (55) who believes there is primarily a weakened vascular tone of neurogenic origin, and with those of Weyl (58) who attributes it more to the functionally weak nervous centers regulating the nutrition of the skin. Ravalgi gives importance to the embryonic development of the skin and nervous system from the identical blastodermic membrane and assumes an ever present close relationship between these two structures.

In congenital syphilis the nervous system and skin show a peculiar weakness, this giving rise to the belief, some authors held of a possible syphilitic origin. The skin of tainted children in apparently good health, is subject to pemphigoid or hyperkeratolic eruptions as, for instance, pemphigus of the pams and soles. This relationship between the central nervous system and the dermis, as the result of congenital lues, has been noted by numerous authors none of whom, however, go quite as far as Ravalgi in stating that the syphilitic virus produces alterations in the central nervous system which later causes the psoriatic manifestation to appear on the skin. Other experimentors (28) agree in general with this theory.

The theory which has the most followers and in which there is a great deal of logic is the one pertaining to the parasitic idea as to the cause of the disease. The greater the volume of research the more the tendency for the wider known dermatologists to lean toward this theory. There is no absolute proof but it is strongly suggested in many ways. Lang (29) was, according to Ormsby (37), probably the first to discuss this phase of the subject; he described a fungus, which he named epidermophyton that he believed to be the cause of the disease. His findings were confirmed but were later shown to be in error as have most research experiments along this line.

Numerous attempts have been made to transmit the disease by direct inoculation which, it would seem should be easy if it were of parasitic origin; however, these attempts have almost uniformly failed. Pestot (5) apparently succeeded in inoculating himself from an infant with vaccinal psoriasis, and previous experimentors had some success in inoculating animals with the disease. Lang (29) apparently was able to show transmissibility from man to rabbits by means of injections of blood, lymph and psoriatic scales from a human subject. Numerous other investigators have tried these methods, however, and obtained only negative results. Schamberg (47) and Pollitzer (41)

and others are among the heavy investigators that have failed in this respect.

This theory is strongly suggested by the fact that psoriasis frequently follows vaccinations and various injuries, and this was particularly emphasized by Weinstein (56). Winfield reported six cases in which psoriasis developed with or upon remissions of attacks of acute tonsillitis, varying from the usual types to the streptococcic types and in one case a tonsillectomy was done. He does not lay any importance to this though it does seem to add to the parasitic theory or at least indicate a toxic manifestation if not a parasitic one.

The fact that borders of patches seem to melt away when in contact with another patch suggests an at least temporary immunity which again suggests parasitism. Similar to this is the susceptibility of the patches to exposure to active rays of the sun or ultra-violet and X-ray. Schamberg (47), Stelwagon (51), Andrews (1), Ormsby (37) and others believe the disease is much more prevalent in the winter months and in cold climates; and it is, in fact, popularly contended that this is true of diseases of this type and are usually parasitic. Sutton (52) does not positively endorse this theory but has a rather strong tendency to lean in that direction because of his belief that the eruption disappears more promptly with the eradi-

cation of focal infections.

Investigations on psoriasis have disclosed other organisms believed to be the cause of psoriasis since Lang announced his opinion on epidermophyton infection. Marcus (35) by skillful and elaborate exclusion of the more common bacteria by cultural methods, in a series of forty psoriatics found that ninety-five percent of them had demonstrated strains of sarcinae which she concludes may be the causative agent. This experiment has never been quite verified. Pollitzer (41) and his co-workers, and Andrews (1) believe psoriasis is probably due to an external microbic agent, though none of these authors will go so far as to state a specific organism. Schamberg, Kolmer, Raizais, and Ringer (50) in experiments on a series of cases found that in nine out of forty-eight cases a positive Wasserman reaction was obtained with alcoholic extract of luetic liver, 287 of another series was positive with cholesterinized alcoholic extract of human and beef heart, and found that some evidently were luetic, not all of the positives by any means had syphilis. They also cultured sixteen different organisms from twenty-four cases, but none appeared to them of etiological importance. A diplococcus "X" was found in five lesions and appeared to have a possible relationship. Goeckerman and O'Leary (19) in their extensive study of Erythroderma psoriaticum proved, at least to their own satisfaction,

that in fourteen of the cases arsenic internally and local irritant drugs or both were responsible. In these cases intercurrent infections seemed to be responsible and in one case a pregnancy seemed to give inception to the disease and to be an existing cause. In the other cases no existing cause could be determined. Thus it seems that in these cases, from whatever cause, stimulation may have been from within.

Pollitzer (40) is a great champion to the parasitic theory. He vehemently states that rheumatism, gout, neurosis and heredity are not the direct etiological factors in the production of psoriasis, but in the present state of our knowledge it can either be denied or confirmed that these factors may have some bearing on the obscure condition of the system which renders the body more or less susceptible to this "specific infection". Pollitzer also believes psoriasis to be a member of the group of parakeratoses to which seborrhea corporis, and in part, eczema seborrheicum belong. He states that it is most probably due to an "external microbic agent". Pollitzer is strongly opposed to the neurogenic and pregnancy-lactation theories. He considers heredity to play a part, but mainly compares the present views of our conception of psoriasis with those of a hundred years ago concerning scabies, which was definitely believed to be caused by a

"fermentescible substance" or the "acrid principle".

Schamberg (48) is perhaps one of the greatest advocates of this theory, but he states that it may possibly be: (1) the result of circulation in the fluids of the body and deposition in the skin of a micro-parasite analogous to that which is observed in syphilis and variola, but that due to the fact that psoriasis is most often seen in people in a condition of excellent constitutional health, it is extremely unlikely; he states (2) that it may possibly be due to implantation upon the skin of an exogenous parasite as is observed in ringworm, favus, and tinea versicolor. He attempted to culture organisms from such lesions but there was such an inconstancy in the organisms that he discounted his observation. *Staphylococcus albus*, *Bacillus mesentericus* and a yellowish *sarcina* were the important ones. He states also (3) that the disease may be due to one of the common facultative parasitic organisms ever present on the skin and in whom a constitutional predisposition renders the skin favorable to growth. There is much evidence tending to support the latter such as the fact that the lesions fade when in contact with a previous site of a lesion, indicating local immunity. On the other hand it is agreed by most authorities that psoriasis is not a contagious disease. Schamberg attempted auto-inneculation on twenty-three psoriatics and

was successful in only three of the twenty-three cases.

Thus it may be seen that psoriasis is a complex disease from the wide diversity of opinions of the many brilliant authors and experimentors. The secret of the true etiology whether, neurogenic, bacterial, parasitic or of another cause still remains one of nature's secrets and one which she stubbornly persists in refusing to divulge to the mind of men.

SYMPTOMATOLOGY and COURSE

Psoriasis is a chronic, occasionally acute, inflammatory disease characterized by reddish-brown flat papules, or circumscribed plaques or areas of varying size, covered with silvery-white imbricated scales.

In typical evolution, Ormsby (37) the papules and plaques of psoriasis always are sharply defined from the surrounding skin, somewhat infiltrated, slightly elevated, and covered more or less completely with silvery-white or mother-of-pearl colored scales, which are arranged in thin layers like mica. On removal of the scales there is exposed in recent lesions, a bright red surface, in older lesions the color is of a duller hue. If the deepest scale, which is often thin, translucent, and closely adherent, is pulled or scraped off, there can be seen several minute bleeding points which, according to Goekerman and O'Leary (19) White (59) correspond to the apices of the papillae beneath. The lesions vary greatly in number, size, shape, and distribution, but the type always remains the same so that in uncomplicated cases, psoriasis is a distinctly dry disease, without vesicles, pustules or other moist lesions.

The primary lesion of psoriasis is a pinpoint or pin-head sized, flat, round or oval, sharply defined, slightly

elevated, red papule, which always, at the earliest moment of observation, is covered either entirely or all but a narrow rim at the border with delicate silvery-white or mica-white scales. The bleeding points produced by forcibly removing the scales may be so minute that they are only visible with the aid of a lens. As the lesion grows peripherally, it may become somewhat more infiltrated, slightly more elevated, and covered with more abundant imbricated scales, but otherwise it retains its original characteristics. Larger areas and plaques are all formed either by a gradual increase in size of the original papules, or by coalescence of a number of papules or smaller plaques. The small plaques formed by the peripheral growth of single papules are usually round or oval, but areas formed by the smaller plaques are irregular in outline.

As a matter of convenience, Ormsby (37), has applied descriptive terms to the lesions of psoriasis to denote their size and arrangement.

Psoriasis punctata describes the disease which occurs in the form of small scale-covered points. Psoriasis guttata indicates that form of the disease with lesions approximately the size of a drop of water. Psoriasis nummularis or discoidea describes the lesions of coin size. Psoriasis circinata or orbicularis is characterized

by patches exhibiting activity at the periphery of a plaque or circle; the center of which is free from disease, a condition usually due to the involution of the center as the disease spreads peripherally. The coalescence of spreading circinate patches produce Psoriasis gyrata and figurata in which, according to Sutton (52) peculiar designs can be produced on the surface of the skin. Psoriasis diffusa indicates that form where the cutaneous is affected in large areas. When the coil glands and hair follicles are chiefly invaded, the disease is termed Psoriasis follicularis. Areas of long persistence and covered with heavy scales, are designated as Psoriasis inveterata. Psoriasis rupioides indicates a variety of psoriasis in which large, conical crusts, marked by concentric rings, occur on many patches Andrews (1). In a given case the lesions may be fairly uniform size, but more commonly, if at all numerous, they exhibit different stages of development and therefore vary in size. They may be arrested at any stage of growth, and persist for months or years as guttata, numular, or larger plaques; or, by continued extension and coalescence, form areas covering an entire region of the body. Though cases are reported in which the surface of the entire body is covered, it is rare that areas of normal skin cannot be detected.

In number and distribution of its lesions and in the course psoriasis varies greatly. The disease commonly begins with one or two small papules, which increase slowly in size. In ordinary cases new lesions appear during the course of weeks, months or years, until there are often from ten to one hundred or more patches of varying size scattered over the body. It is not unusual, however, for the disease to remain for years limited to two or three coin sized areas, situated commonly over the elbows and knees. Occasionally a single patch may persist indefinitely without the appearance of others. In other instances but chiefly in recurrences of the disease, a large number of punctate papules may appear within a few days; and at times even a generalized acute attack occurs. In the same individual the number, size and distribution of the patches may vary from time to time, Sutton (52). With many patients the Psoriatic areas partially or wholly disappear in summer only to return in cold weather, Andrews (1). In a smaller number of cases the disease is worse in the summer and better or entirely absent in the winter. Without influence of climate or any other known cause, the disease may disappear, partially or wholly, for months or years and then return. In recurrences of the disease, the lesions do not necessarily correspond in number, size or distribution with those of earlier attacks Crocker (12). In acute febrile and

Other intercurrent diseases, patches of psoriasis may fade or disappear temporarily, Winfield (61). Involution of a patch of psoriasis begins in the center, and is recognized by diminution of hyperemia and in the scaling. The process progresses slowly until no trace of the disorder is left. Temporary pigmentation may remain for weeks after the scaling and infiltration have completely disappeared. In distribution Schamberg (48) and others agree to exceptions to the rule. The sites of preference of the disease are the extensor surfaces of the extremities, especially about the elbow and knee, in which situation it is decidedly most common. After these locations should be named in order the scalp, the region of the sacrum, the upper surface of the chest, the face, the abdomen, and the genitals, more rarely the hands and feet.

Upon the scalp plaques of well-defined contour, covered with thick whitish scales, may mat the hairs, but alopecia rarely results. Often a fillet or band one or two inches in width projects beyond the border line of the scalp over the forehead. When the vertex is bald from physiological loss of hair the patch of psoriasis usually lingers near the fringe of hair left at the sides of the head, projecting thence to the region of baldness, Ormsby (37). On the face the lesions are usually indistinct and small in size, being displayed over the cheeks, chin, nose, avoiding parts near

the mucous orifices. In the genital region, also the lesions are usually small and indistinct with very thin transparent scaling of the lesions of the glans penis, and more scaling over the erectile portion, and over the scrotum there are often lesions with a heavy coating of scales and the psoriasis is usually complicated by fissures, moisture, and other evidence of acute inflammation.

The hands, feet, fingers, and toes are not often involved, and the palms and soles only rarely. Sometimes (10, 17, 23, 1, 37) the disease has been limited to the palm before other characteristic lesions occur. In many cases the nails are attacked, being thickened, eroded in points, irregularly laminated, rigid, brittle, and yellowish-white or dirty-yellowish in color. In certain cases the nails alone are attacked. Occasionally bullous lesions develop on the hands and the soles. Through cracking and partial destruction of horny masses the patches may assume a worm-eaten appearance.

Psoriasis rarely affects the mucous surfaces. The Psoriasis linguae may be traced to some other cause.

In a patient subject to psoriasis, a local irritation, such as a pin scratch or a mustard plaster, may cause new lesions to appear at the site of the irritation.

Crocker (12) describes a form of Psoriasis punctata in which the lesions are limited to the sweat glands. Another

form is limited to the hair follicles.

The amount of scaling varies greatly with the different individuals and in the same individual. Ordinarily, the scales are abundant and thickly heaped up over even small areas, sometimes they are sparse over larger areas. Free perspiration, friction by the clothing, or frequent bathing may prevent the accumulation of scales over areas where they would otherwise be abundant. Where the epidermis is thin, the scaling is less; therefore over flexor surfaces, near the mucous orifices, and on the back of the hand the scaling is less than over the extensor surfaces and other regions. The scaling is more pronounced in advanced years. The scales may adhere with considerable firmness to the patch, or may be shed freely from the surface, in pronounced cases powdering the clothing of the patient or the sheets of the bed on which the patient reposes at night. As a rule, the scales are disposed over the entire patch, extending slightly beyond the margin.

Instead of a lustrous white, the scales may display a deep yellowish shade; and instead of being imbricated they may form continuous sheet of exfoliated epidermis (52). When the eruption is disappearing the scales fall, leaving a pigmented or slightly discolored patch of integument.

Psoriasis is essentially a chronic disease, but may present at times acute exacerbation, and occasionally begin

as an acute process. In the acute stages the inflammatory symptoms are more marked, and the lesions are of a brighter red color, and not so sharply defined as in the ordinary forms of the disease. The scales are fewer in number, thin and easily detached, and the sensations of burning and itching may be severe. When acute, the papules are usually numerous and punctate, and may appear on the face. In other instances, the patches may be as large as a small saucer, are dark or lurid red over the entire area, and are covered with a more uniformly constituted thin, squamous film or sheet of semitransparent, delicate membrane, through which the red glare of the patch beneath is visible, Sutton (52). This condition may be seen also in young persons to whom arsenic has been administered for the relief of the disease, with the production of irritative affects. An acute attack may come and go as such, but usually terminates in a chronic form of the disease.

Subjective sensations may be entirely absent in Psoriasis, even when it is extensive. There is, however, usually slight, but occasionally severe itching. In acute cases burning and smarting are often present. In the exceptional cases the subjective sensations interfere with sleep and rest; otherwise the disease does not affect the general health of the individual. As a rule, the psoriatic individuals are in excellent general health, due probably to their charac-

teristically high white blood cell count which reserve gives a rather high immunity to and defense against other disease processes.

A typical and complicated forms of psoriasis occur in which the character of the lesions is modified considerably. Rarely the scales may be heaped up in the center in the form of an oyster shell, producing *Psoriasis rupioides*. In a few instances, the accumulated scales have the appearance of a cutaneous horn according to Gassman as quoted by Ormsby (37). Occasionally sufficient thickening occurs to produce a wart-like appearance. These cases are termed *Psoriasis verrucosa*, Crocker (12). The scales may be slightly greasy and the surface beneath exhibit a trace of moisture making the diagnosis between psoriasis and dermatitis between psoriasis and dermatitis seborrheica difficult if not impossible. The two conditions may even be associated. Occasionally in moist situations, on the sensitive skin of children, or as an effect of local irritation or infection, the patches may be acutely inflamed and indistinguishable from ordinary eczema. Occasionally eczematation of the lesions occurs. In these cases there may be itching and infiltration of the skin, with vesicular and other lesions foreign to *Psoriasis*, and a catarrhal discharge. Acute generalized flaccid purulent bullae have been reported to later change into the typical psoriatic lesion, Ormsby (37).

Pustular psoriasis is a variant of psoriasis and does not signify a secondary pyogenic infection implanted on the disease, but indicates a form in which a particular type of pustulation occurs as an essential part of the process. The pustular complication may develop in the course of ordinary psoriasis and only in certain patches or it may be an essential part of the disease from the beginning. The pustules closely resemble those of acrodermatitis perstans, dysidrosis and mycotic infections. The predilection, Farber and Ormsby (2, 37) being the thenar eminences of the palms and the medial side of the plantar surfaces. It is bilateral as a rule, the nails and mucous membranes are unaffected. The patches begin as reddened areas, in which pin-head sized intraepidermic pustules form which may become confluent or dry up in situ. Bacterial Cultures are sterile. The sequelae of psoriasis are, as a rule, nothing more than transitory pigmentation but cases are reported in which involution of the lesions has been followed by superficial scars, keloid formations, persistent deep pigmentation, or permanent Achromia, Crocker (12). In some cases these unusual sequelae were due, undoubtedly, to the treatment. A few instances have been reported by Schamberg (48) and others, in which epithelioma has followed verrucous lesions which had developed on psoriatic patches. General exfoliative dermatitis occasionally develops in the course of psoriasis. It may be precipitated by arsenic or by local irritative applications or independently. It may be recurrent.

PATHOLOGY

Psoriasis has been accepted as a clinical and histologic entity. The identity of the condition has been conceded. Yet in carefully investigated cases of Psoriasis the involvement has eventuated in other conditions, as for instance Mydoides, MacKee and Foster (31). At times it is difficult, even impossible, to differentiate clinically between psoriasis and certain other scaling dermatoses, such as eczema, syphilis, lichen planus, lupus erythematosus and other conditions. Not infrequently it is equally difficult to make a diagnosis in the laboratory. In many cases of typical psoriasis there are individual lesions that alone do not suggest psoriasis. The lesions may resemble the eczematous type, lesions resembling seborrhea, Lichen chronica simplex, pustular psoriasis, lesions of Intertriginous nature, lichenoid in type and nodular.

Epstein and Glick (13) experimenting with the blood of psoriatic patients found that the iodine numbers of the blood varied sufficiently that no clinical significance could be attributed to their findings using linseed oil instead of animals fats. Farber (2) in his description of pustular psoriasis, shows the apparent pathological similarity to the common type of psoriasis as described by Civatte (11).

In the dermis the papillae are elongated and edematous. The vessels are congested, and around them is a leukocytic

infiltration of moderate intensity consisting chiefly of mononuclears, with occasional polymorphonuclears.

The epidermal changes of importance are due to the migration of these leukocytes into the rete malpighi, disintegrating it and forming a sort of tunnel leading from which they emerge. The malpighian cells at this site become swollen from intracellular edema and to produce keratohyalin, so that there is no stratum granulosum and parakeratosis is the result. The migratory leukocytes are, in the earlier stages of this process, chiefly mononuclears, which preponderate in the dermal infiltration, but later emerge numbers of polymorphonuclears. The leukocytes become imprisoned in the upper layers of the rete and form a lenticular mass--the so-called "abscess" of Munro-Sabouraud, which, however, is only clearly seen when the exocytosis is extensive. This "abscess" is formed largely by polymorphonuclears but mononuclears are also present, it becomes enclosed between layers of parakeratotic cells, and is exfoliated with a scale.

The epidermis is, as a whole, acanthotic and the interpapillary portions are lengthened, but the epidermal strata are reduced in number above the papillae. Kyrle and others according to Ormsby (37) believe the initial changes occur in the epidermis while some are of the opinion that the corium is first involved. These authors have found vascular

dilatation with a swelling of the endothelial lining of the vessels, and perivascular infiltration of lymphocytes, polymorphonuclears and fibroblasts. The papillae are elongated and broadened and at times club-shaped fitting the interspaces of the rete pegs. The collagen is edematous, but the elastin is not affected. In psoriasis verucosa there occur hyperkeratosis, cornification of the upper portion of the rete, and excessively elongated rete pegs and papillae.

The histopathology of pustular psoriasis is identical to that of acrodermatitis continua, according to Barber (2) except that: (1)--The early infiltrating cells, as in ordinary psoriasis, consists chiefly of lymphocytes, the polymorphonuclears tending to make their appearance later; (2) --The resistant epidermic framework of Acrodermititis continua is less evident and; (3)--The "balloon cell" formation is practically absent.

The blood presents a characteristic picture of a chronic eosinophilia and there is usually an elevation in the white blood cell count with a differential count within normal limits. Total nitrogen of the blood is elevated to a varying degree.

TREATMENT

The treatment of psoriasis has been one of the most baffling problems faced by medicine. Since Biblical times, when all such skin diseases were called Leprosy and the people so afflicted were isolated into the leper colonies, and cures came only by the action of miracles, man has tried to remedy this obnoxious disease. At the present time therapeusis must still concern itself with palliative and temporary measures. The permanent cure is still in the realm of the unknown and we are wandering in a maze of literature giving only conflicting reports. From the theory that this condition was a throw-back and that the skin of psoriatics was comparable to that of the lizard, to the most elaborate of schemes we wander in a review of the literature on psoriasis.

A great dermatologist, according to Haldin (23), who had retired, said he had as his only consolation for having given up active practice was "that it was no longer necessary for me to administer spiritual consolation to psoriatics".

The therapeusis of psoriasis is incompatible with research for a successful agent. Unlike syphilis and Malaria in which bismuth and quinine were known therapeutic agents long before spirochaeta pallida and plasmodium were discovered as the causative agents. There is no known

remedy to eradicate psoriasis.

There is no disease of the skin that gives the physician more concern than psoriasis which ranks second to eczema as a common skin affection, according to the views of Beinhauer (3). Although this disease has been studied by many observers, nothing new has been given us and its cause and cure are still "unknown" in medicine.

To the practicing physician the patient with psoriasis is a pathetic picture ever trying some remedy which will permanently alleviate all his symptoms with the end result that he sooner or later loses faith in medicine because his wish has not been gratified.. He then falls into the hands of "Quacks" and promiscuous use of the innumerable "cures" advertized. Cures promised by "D.D.D.", "S.S.S." and Oil of Sassafras along with multitudes of others are remote and become expensive to the patient. In discussing this disease with the patient Beinhauer (3) believes it is imperative that the physician impart the true prognosis. The patient should be given a quiet, straightforward explanation of this condition and made to understand that no "cure" for this disease can be promised and its cause is still unknown. Again it should be explained that palliative measures can be successfully instituted to relieve temporarily the patient of his cosmetic disfigurement and subjective symptoms. The purpose of the explanation of

psoriasis is two-fold because the patient can early reconcile himself to his fate and he, then, can become amenable to the treatment outlined.

Every patient afflicted with psoriasis should receive a complete physical examination in order to detect any pathologic defect. Especial attention should be paid to focal infections, constipation and glandular disturbances, and the corrections for these ailments should be made as soon as possible. The personal hygiene of the patient should be strict and mental worry and care should be eliminated where possible. Moderate exercise in the open air is advocated.

Pulkley (8) is an ardent advocate of strict diet for a cure and relief of psoriasis. He completely excluded meat from the diet of his patients. In 2,100 cases in which a large number were put on the strict vegetarian diet, he reports excellent results. He also noted the fact that when a patient "broke over" the regulations he or she reported a recurrence. Schamberg (49) disagrees with a low protein diet due to the fact that it is practically impossible for patients to maintain a health state because of malnutrition. He found that there was not an excess of uric acid in the urine of psoriatics and disagreed with the "Gout" theory as an etiological agent and diet therapy to reduce the urates. Schamberg, Kolmer, Raisas, Ringer (50) agree that there is a tendency to nitrogen metabolic disturbances. They observed that psoriatic lesions did not sweat and the acidity of the body sweat was increased over

other areas. They advocated, and were supported by Levin and Silvers (30), a dietary limit to the salt intake with sweat baths to eliminate the salt more rapidly. They used cold cream or boric acid ointment on the skin to prevent drying and irritation. The patients were relieved and clear in as short a time as two weeks. Hospitalization is necessary for success in this treatment. Reinbauer (3) takes exception to any form of diet. He states that the diet should be nutritious, wholesome and easily digested. He believes that diet plays a minor role in the production of this disease although he recognizes the disagreement of other authors who still insist on a meat or purine-free diet, or other modified diets. Alcohol, tea and coffee are irritants that should be avoided.

There is no specific internal medication for psoriasis. Arsenic stands first, according to Sutton (52) and others, as the drug choice used in combating this disease. Winfield (61) used salvarsan in a patient whose Wassermann reaction was four plus and who was psoriatic. The patient was given two injections and a quick permanent cure was reported. Pollitzer (41) treated a ten year psoriatic, who had syphilis for six months, with salvarsan and found no effect on the psoriatic lesions. According to Ravolgi (44) Mauriac described three types of psoriasis: Arthritic, herpetic, and syphilitic. For the last form the remedy, he found, was potassium iodide. Ravolgi found that ten percent caco-

dylic acid used subcutaneously two or three times a week had definite advantage over other forms of arsenic. He concluded that when the internal use of arsenic has no effect in psoriasis, potassium iodide is indicated. Many of his cases showed brilliant results from potassium iodide combined with white precipitate ointment locally. No recurrences were reported. Fowler's solution in ascending doses to the point of tolerance is a favorite drug although sodium arsenate, asiatic pills and sodium cacodylate have their advocates. Arsphenamine and neoarsphenamine were found useless by Beinhauer (3). Arsenic must be administered with care and a close check of the urine should be made for evidence of any kidney irritation.

The salicylates as a therapeutic agent have received wide support during the years of the struggle to find a specific cure. These have been used both for an external or local application and as an internal agent. Crocker (12) strongly supported the use of Salicin as a powder. He gave 15-20 grains three times a day. Mook (36) used salicylic acid and white precipitate of mercury each five percent in white petrolatum on the scalp daily. Tar was used instead of mercury if there proved to be an idiosyncrasy. Pernet (39) uses a salicin treatment one gram to 30 cc of water given orally three times a day after meals. The dose was increased to 1.5 to 2.0 grams to 30cc water. Peppermint was included to conceal the bitter, nauseating taste

of salicin. Pernet disagrees with Crocker in that he believes pills or powder of salicin to be worthless. Soothing applications were made to the lesions during treatment. The salicylates are found by most authors to be especially efficacious in combating the arthritis which often accompanies psoriasis. The use of sodium salicylates given intravenously has gained popular favor recently but conflicting reports have been given from its use.

Along with and coinciding to the development of the various theories and treatments has evolved the autohemotogenous injection measures. Fox (15,16) found that auto-genous serum combined with ten percent chrysarobin in lanolin to clear up the condition but recurrences were found to be common.

Campbell and Frost (10) in using an intramuscular injection of a suspension of the patient's own finely ground psoriatic scales. They used this treatment on fifteen patients using .2 gram of the ground scales to 20 cc. pure alcohol. One to four cubic centimeters was the average dose and used every three or four days. They found a varying response and concluded: (1) The time varies for the objective changes to take place, (2) A definite thinning of the scales was noted in all cases as the first sign of improvement, (3) The next change noted was the gradual paling of the centers of the lesions. The smaller areas showed a single pale center, the larger plaques showed multiple,

pale foci, these areas developed into normal skin, (4) The last stage was a few discrete areas of the original lesion which had a more resistant quality. Wrong (62), using this technique found injection of the patient's scales to be useless if the patient tends to improve spontaneously. Due to the alcohol, probably, the injections are painful to the patients. Wrong used ten milligrams of scales, ground in a mortar, to 1 cc, normal saline and added 25 percent formol. The suspension was kept for one week at thirty seven degrees centigrade and shaken occasionally during this time. It is tested for sterility after forty-eight hours incubation. Wrong used this modified technique and injected two to three cubic centimeters every other day. Too few cases were treated in this manner to come to any definite conclusion. Farber, in his discussion of Wrong's paper, saw the lesions as temporarily improved but remissions were common. Greenbaum (21) in experiments on protein-shock found that if the patients had a febrile disease of some duration the lesions disappeared. Whole serum, milk, typhoid vaccine, and extract of alfalfa were used to induce artificial fever. In the febrile cases many received salicylates in some form to relieve the pain and supporters of salicylate treatment argue that the improvement of the psoriatic lesion is probably due as much to the salicylates as to the fever. Later tests with fever have been disappointing to its supporters.

In recent years the roentgen rays have been used in the treatment of psoriasis. These are the cleanest, most efficient, quickest and most dangerous forms of treatment for psoriasis. The application should be given only by one who has been trained in their use. Unfiltered rays are used by Feihauer (3) in fractional doses of one-eighth to one-half skin units at five to seven days interval. Generalized psoriasis should not be treated at one sitting but different areas treated daily. This is the best treatment for localized psoriasis when the patient is anxious to be relieved of the lesions in a short time. The treatment of psoriasis requires the utmost patience of both the patient and the physician. X-ray gives no pain or "smarting" to the patient who is probably used to such conditions under certain other treatments and he may be able to see no results in the first few applications and become distrustful of the treatment. The physician should keep this in mind and combine some psychotherapy with his treatments, always keeping in mind the cosmetic as well as the general welfare of his patients.

In later years the use of the ultra violet ray has come into a prominent position in the treatment. This followed the observation made that since the disease is uncommon in negroes and in the tropics that climate may have a bearing on the disease. This theory has been supported by Goeckerman (18), Haldin (23), Greenbaum (21) and

others who have found that in the great majority of cases the disease is worse in the winter and the number of lesions in the summer is greatly diminished or they completely disappear only to return the next winter. This led to work on the application of the various "rays" in sub-erythema doses to the skin. The violet ray has produced a disappearance of the lesions as has the Gruein ray in the hands of Goeckerman and O'Leary (19). Infra red ray has not been found of value by these authors. The majority of the writers find that they get better results by combining ray treatment and some other form. Goeckerman sensitized the skin artificially with crude coal tar or pure tar then used ultra violet light. The tar was applied to the patches about one-eighth inch thick and allowed to remain on the lesions until the next day when they are treated with the quartz lamp. The excess of tar is removed with olive oil. The lamp is applied for one minute at thirty inches and exposure daily with the dosage lengthened by one-half minute. This regime is continued for two to four weeks, and recovery lasted from a few weeks to several years. The cases with or without arthritis were helped equally.

Sweltzer and Allen (53) treated twenty patients with a combination of acriflavine and alpine lamp. They found no toxic effects were produced if it was injected slowly. They dissolved .1 gram ampoule in 20 cc. sterile distilled

water and injected it three times a week. With the stubborn cases they used the alpine lamp in sub-erythema doses. In all cases throughout the treatment an ointment of three percent salicylic acid and six percent sulphur in vaseline was applied locally. In the twenty cases all but three showed improvement and in four cases the results were striking. They concluded that intravenous acriflavine injections were of practical value in the treatment of psoriasis. The use of the ultra violet ray combined with local use of chrysarobin was successful according to Goeckerman and O'Leary (19). Zakon (63) combined trypaflavine, a derivative of coal-tar, and the quartz light in his treatment. He found that when trypaflavine was injected intravenously there developed areas of dark hyperpigmentation resembling the melanosis of Riehl. He used 5 cc. of five percent aqueous solution in the vein. Fifteen minutes later the patient was put under the quartz light for twenty seconds at forty centimeters. The injections were found to be most effective if given three times a week.

Glandular products have lately been given considerable attention. Pituitary extract of both anterior and posterior lobes have been given intramuscularly with varying results being reported. Crocker (12) has used Thymus extract intramuscularly without much success and irradiation of the thymus gland has not proven to be satisfactory. Also Thyroid extracts and iodides have been used with in-

different results and one must be cautioned in using them. Greenbaum (21), Stelwagon (51), Beinhauer (3) and others look upon the use of glandular extracts as having at most questionable value.

Grubb (22) found that in parts of West Virginia, in people whose diet was deficient in many respects and especially butter, psoriasis can be cured by temporary massive use of butter in the diet and inclusion thereafter. He cites several cases and concludes that the profession should investigate this further.

Gold as a therapeutic agent has been experimented with by several workers chief of whom have been Mann and Bouglais (34). They used a thirty-seven percent solution of a double thiosulphate of gold in distilled water which was given intravenously once a week. They concluded that: (1) Gold has a very limited effect on the course of the disease, and (2) Treatment is not without some danger. Haldin (23) came to the same conclusions after using it.

Magill (33) using intravenous mercurochrome found it useful in the few cases in which it was tried. Badahur of Vienna finds that flourescin intravenously, in gradually increasing doses from .5 cc. until 50cc. have been given has cleared some of his cases. Massive doses of vitamin D in chrystalline form have also been reported by Ceder and Zon.

Crocker (12) says that although the psoriatic lesions

can be removed by either external or internal treatment singly, a combination is quicker and more effective. The purpose of local medicine in dermatology is to protect the parts, rid the skin of waste products of its disease and reverse the pathology.

Drugs having a keratolytic action are advised in psoriasis and of these chrysarobin, acid salicylic, neo-robin, pyrogallol, betanaphthol, the tars and ammoniated mercury are the best. Chrysarobin is the most effective and yet the most dangerous because of its complications -- dermatitis and conjunctivitis. The combination of chrysarobin in one to ten percent ointment and autohemotherapy has given Beinhauer (3) excellent therapeutic results. He advocates the combining of the several local agents. Crocker (12), Mook (36), and others support this treatment. Heavey (25) uses chrysarobin in weak strength to act as a parasiticide. This arises either by blood stream formation of complement or direct action on the organism. He also gives chrysarobin by mouth, thirty drops of .2 percent solution one hour after dinner. Cures have been reported by him also in using intravenous injection of chrysarobin in properly calculated doses. Ormsby (37) and others use chrysarobin in local, external applications only.

Various soothing baths are advocated by many authors following the use of an irritating local treatment. Bein-

hauer (3) advocates the frequent taking of baths as a means of improving the personal hygiene of the patient. Pernet (39) advises the use of an occasional bicarbonate of soda bath during and following his salicin treatment. Goeckerman and O'Leary find the mild corn starch bath of advantage. The medicated bath of Balzer has shown some good results according to Greenbaum (21). This bath consists of hot baths five times a week for three to four weeks. Each bath contains: Cade oil 100 parts, yolks of two eggs, fluid extract of quillaja q.s. emulsion, chrysarobin 6 parts, aquae destillatae 1000 parts, extract of violet 3 parts.

Crude coal tar is used by Zakon (63) and Goeckerman (20) in sensitizing the skin to violet ray. Most authors advocate its use locally in generalized and acute exacerbations of the disease.

Dioxyanthranol or anthranol has been used by Haldin (23) in some cases in place of chrysarobin. He finds that its action is less irritating and produces almost the same effect of increasing the rate of oxidation and production of melanin in the skin.

CONCLUSION

In drawing up conclusion on a review of the literature written on psoriasis one is made aware that this disease presents a complex problem that belies its apparently benign character. This disease has an ancient origin as it is spoken of in the Bible and the old papyrus records of ancient Egypt. The symptomatology is well known and the pathological picture has been well and completely worked out. The etiology of psoriasis is at present as obscure as it was in the olden times. An extensive amount of work and investigation has been done by many brilliant dermatologists, and great amounts of money have been spent in an effort to solve the mystery of the etiology of the disease.

The treatment, likewise, is varied almost as much as there are investigators. Excellent results may be obtained by one writer while another man, using the same technique, may fail entirely to alleviate the disease. X-ray remains the best, and most reliable therapeutic agent we have at hand to combat the disease. Other preparations and treatments are known to temporarily relieve the symptoms and signs, but it still must be confessed that no permanent cure can be promised to the anxious patient. Combination and coupling of the remedies have been found by most authors to be the best form of treatment. The patient is to be considered primarily in the treatment, and an honest prognosis given him with the best treatment, in the judge-

ment of the physician.

In working out the literature on this subject I feel that one possibility is being overlooked, That is the possibility of there being correlative pathology in some part or organ of the body that might give some clue as to the etiology or treatment of the disease process. This is an attempt to work the problem backwards, but careful and complete autopsy reports on psoriatic individuals, no matter what the cause of death, might throw some light on a more deeply seated condition than is now suspected. Perhaps a committee on psoriasis could be set up or formed within the ranks of the dermatological organizations to direct work and research on this disease.

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